



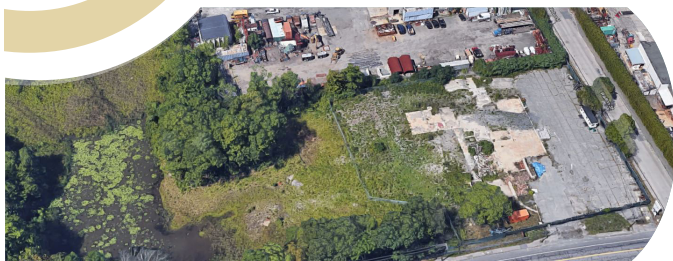
SUPERFUND

Cleaning Up New England

PROPOSED PLAN

# Walton & Lonsbury Site Attleboro, MA

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND



**THE SUPERFUND PROGRAM** protects human health and the environment by locating, investigating, and cleaning up abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and ground-water to productive use.

## YOUR OPINION COUNTS: OPPORTUNITIES TO COMMENT ON THE PLAN

The U.S. Environmental Protection Agency (EPA) will be accepting public comments on this proposed cleanup plan from July 26, 2019 through August 26, 2019. You do not have to be a technical expert to comment. If you have a concern, suggestion, or preference regarding this Proposed Plan, EPA wants to hear from you before making a final decision on how to protect your community.

EPA is also specifically soliciting public comment concerning its determination that the alternatives chosen are the least environmentally damaging practicable alternatives for protecting wetland and floodplain resources.

Comments can be sent by mail, email, or fax. People also can offer oral or written comments at a formal public hearing (see below). If you have specific needs for the upcoming public meeting or hearing, questions about the facility and its accessibility, or questions on how to comment, please contact Sarah White (see below).

### Public Informational Meeting immediately followed by a Formal Public Hearing

Both will be held:  
Wednesday, July 31, 2019 at 6 pm  
Attleboro Public Library  
74 North Main Street  
Attleboro, MA (hearing at 7:30)

*In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law that established the Superfund program, and 40 C.F.R. § 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Remedial Investigation/Feasibility Study, this document summarizes EPA's cleanup proposal. For detailed information on the cleanup options evaluated for use at the Site, see the Walton & Lonsbury Superfund Site Feasibility Study and other documents contained in the Site's Administrative Record, which are available for review online at [www.epa.gov/superfund/walton](http://www.epa.gov/superfund/walton) or at the Site information repositories at the Attleboro Public Library, 74 North Main Street, Attleboro, MA 02703, and the EPA Region 1 Records Center, 5 Post Office Square, First Floor, Boston, MA 02109.*

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#### KEY CONTACTS:

##### ETHAN FINKEL

EPA Project Manager  
617-918-1293  
[finkel.ethan@epa.gov](mailto:finkel.ethan@epa.gov)

##### SARAH WHITE

EPA Community  
Involvement  
617-918-1026  
[white.sarah@epa.gov](mailto:white.sarah@epa.gov)

##### DAVID BUCKLEY

State Project Manager  
MassDEP  
617-556-1184  
[david.buckley@state.ma.us](mailto:david.buckley@state.ma.us)

#### GENERAL INFO:

##### EPA NEW ENGLAND

5 Post Office Square  
Suite 100  
Boston, MA 02109-3912  
(617) 918-1111  
[www.epa.gov/region1](http://www.epa.gov/region1)

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## CLEANUP PROPOSAL SNAPSHOT

The Proposed Plan for the Walton & Lonsbury (W&L) Site generally includes the following components:

- Removal and off-site disposal of approximately 730 cubic yards of any remaining W&L facility features (including the floor slab and cobble-filled “pit”);
- Soil excavation and off-site disposal of approximately 7,900 cubic yards of contaminated soil at the former W&L Property;
- *In-situ* soil treatment of hexavalent chromium, trichloroethene (TCE), and other chlorinated volatile organic compounds (VOCs) remaining in soil and overburden groundwater at the former W&L Property;
- *Ex-situ* soil blending/treatment and backfilling below the water table as necessary; clean soil to be backfilled above the water table; and excavated areas will be restored and graded;
- Extension of the existing permeable reactive barrier (PRB) wall along Bliss Brook to reduce hexavalent chromium discharge to the Brook to the less toxic, less mobile trivalent chromium form, and long-term operation and maintenance (“O&M”) of the system;
- Mid-plume *in-situ* soil treatment along the west side of North Avenue to reduce the mass and toxicity of hexavalent chromium and TCE;
- Excavation and off-site disposal of approximately 310 cubic yards of lead-contaminated surface soil exceeding risk-based cleanup levels at residential yards west of North Avenue;
- Contingency implementation of *in-situ* bedrock groundwater treatment west of North Avenue to reduce the mass and toxicity of hexavalent chromium and TCE, if future investigations indicate groundwater contaminant levels are threatening or are already impacting the Bungay River Water Resource Protection District (“the District”), downgradient from the Site, above federal and state drinking water standards and establishment of restrictions on the use of any contaminated groundwater within the District until groundwater cleanup standards are achieved;
- O&M of the existing engineered cover system adjacent to Bliss Brook;
- Restoration with native vegetation of any wetland/floodplain habitat altered by the remedial action; and
- Land use restrictions (called “Institutional Controls” or ICs).

In addition to these cleanup components and Institutional Controls to protect the remedy where unrestricted use standards are not achieved, the overall remedy will include long-term monitoring and periodic reviews, at a minimum, every five years to assess protectiveness of the remedy.

EPA’s proposed remedy for the Site, including construction, O&M, and long-term monitoring, is estimated to cost approximately \$22 million and is estimated to take approximately three to four years to design and implement. A more detailed description of this proposal is outlined in this document and in the Feasibility Study Report (FS) dated July 2019.

## A CLOSER LOOK AT EPA’S PROPOSED CLEANUP APPROACH

The Final Remedial Investigation (RI) Report dated June 2019 summarizes the nature and extent of contamination at the Site and was used to prepare the FS that identifies all of the alternatives EPA considered for the proposed cleanup. The FS evaluated the efficacy of different cleanup alternatives to protect human health and the environment by preventing risk of exposure to Site-related contaminants in soil, groundwater, surface water, and indoor air. The cleanup was split into a number of different components that address different locations on the Site and different contaminated media. Based upon the alternatives evaluated in the FS, EPA’s long-term cleanup approach for the Walton & Lonsbury Superfund Site includes the following components:

## Soil in Residential Yards West of North Avenue

EPA's preferred alternative for the Soil in Residential Yards West of North Avenue cleanup is **Alternative SL-3, Excavation and Off-Site Disposal**, as described in the FS, which includes the following components:

- Excavation of approximately 310 cubic yards of lead-contaminated soil with concentrations in excess of proposed risk-based cleanup levels from six residential properties;
- Utilize erosion control measures (e.g., hay bales and silt fences) and perform dust control and air monitoring as necessary during excavation;
- Off-site disposal of all excavated material at an appropriate off-site permitted facility; and
- Excavated areas will be restored with clean, imported backfill to grade and re-vegetated with native vegetation to control erosion and restore any altered wetland/floodplain habitat.

## Overburden (Shallow) Groundwater and Surface Water

EPA's preferred alternative for the Overburden Groundwater/Surface Water cleanup is **Alternative GW/SW-3B, Source area soil removal with *in-situ* soil treatment, extension of the permeable reactive barrier, and mid-plume *in-situ* treatment**, as described in the FS, which includes the following components:

- Removal and off-site disposal of approximately 730 cubic yards of remaining building concrete floor slab and the cobble-filled "pit" to allow for removal of underlying contamination;
- Excavation of approximately 7,900 cubic yards down to a maximum of 15 feet bgs of highly-contaminated soil within the source area;
- Soil blending with reactive media (zero-valent iron, or ZVI) within the open excavation area (approximately 15 to 30 feet bgs) down to the top of bedrock;
- Backfill with additional reactive media (ZVI) and sand blend to 7.5 feet bgs or the water table (whichever is higher), with further clean sand and graded topsoil to ground surface;
- De-watering the portion of the excavation that extends below the water table, and for any excavated soils that require dewatering, collect the water in frac tanks and treat on-site, as needed, to meet surface water standards for discharge to surface water (or disposal at an appropriate off-site permitted facility);
- Construction of an extended PRB filled with reactive media to augment the existing PRB intercepting the overburden groundwater plume prior to discharge into Bliss Brook;
- Excavation of approximately 4,400 cubic yards of soil in order to construct the PRB and disposal at an off-site permitted facility;
- Restoration of wetlands/floodplain altered by installation of the PRB and any other components of the remedy;
- Mid-plume *in-situ* soil treatment via a series of borehole wells filled with reactive media down to the top of bedrock, approximately 200 feet in length, running north-south along North Avenue, to intercept and reduce the toxicity of hexavalent chromium and chlorinated VOCs in the overburden groundwater plume;
- Long-term monitoring of the overburden groundwater plume, surface water in Bliss Brook, and buildings with existing sub-slab depressurization systems (SSDSs) or which may have the potential for vapor intrusion;
- Maintenance of any new and existing remedy infrastructure components, including the engineered cover system, PRB, existing SSDSs, and periodic replacement/regeneration of reactive media in the PRB and mid-plume treatment wells;

- Institutional Controls to 1) prohibit future residential use at the W&L Property 2) prevent future construction worker exposure to groundwater contamination at the W&L property, until groundwater cleanup levels are achieved; 3) prevent contact with contaminated groundwater and the installation of non-drinking water wells (i.e. irrigation wells) across the extent of the site-wide groundwater plume where non-drinking water scenario cleanup levels for residential groundwater are exceeded and/or which may cause migration of the contaminated plume, until groundwater cleanup levels are achieved; 4) prevent disturbance of the existing engineered cover system and PRB, and any new remedy infrastructure components; 5) prevent contact with soil beneath the existing engineered cover system adjacent to Bliss Brook; and 6) require either a vapor intrusion evaluation or vapor mitigation system be installed if a new building is constructed over the shallow groundwater VOC plume (within or to the downgradient neighborhood of the former building on the W&L Property); and
- Periodic five-year reviews to assess remedy protectiveness.

## BEDROCK GROUNDWATER

EPA's preferred alternative for the Bedrock Groundwater cleanup is **Alternative BR-3, Institutional Controls and contingency remedy of focused *in-situ* injections**, as described in the FS, which includes the following components:

- Institutional Controls to 1) prevent contact with contaminated groundwater and the installation of non-drinking water (i.e. irrigation) wells within the bedrock plume boundary until groundwater cleanup goals are achieved; and 2) prevent the installation of wells within the potentially impacted portion of the Bungay River Water Resource Protection District to prevent plume migration from the contaminated non-drinking water area into the District;
- Pre-design investigations to further refine the horizontal extent of the contaminated bedrock groundwater plume so that the area potentially requiring additional remedial action can be defined;
- Monitoring of the site-wide bedrock groundwater contaminant plume to evaluate the attenuation of hexavalent chromium and chlorinated VOCs and to determine when groundwater cleanup levels for the non-drinking water area are achieved;
- Periodic five-year reviews to assess remedy protectiveness; and
- A contingent remedy to prevent contaminated plume migration into the Bungay River Water Resource Protection District and restore, if necessary, groundwater to drinking water levels within the District. The contingent remedy may be implemented if groundwater contaminants are found to exceed federal and state drinking water standards within or adjacent to the District. The contingency remedy includes the following additional components:
  - Focused *in-situ* bedrock injection treatment line approximately 200 feet in length along the west of North Avenue via a series of borehole wells installed 10 feet into bedrock to be injected with reactive media (ZVI) to reduce the toxicity of hexavalent chromium and chlorinated VOCs;
  - Downgradient monitoring of the bedrock groundwater contaminant plume; and
  - Institutional Controls to 1) prevent contact with and consumption of contaminated groundwater within the contaminated areas of the District until groundwater cleanup levels are achieved; and 2) maintain the integrity of any remedy infrastructure components. There will be a permanent well restriction zone established along the border of the non-drinking water aquifer and the District to prevent the installation of wells that might draw contaminated groundwater into the District.

## **EPA IS REQUESTING PUBLIC COMMENTS ON THE FOLLOWING PROPOSED DETERMINATIONS**

### **Impacts to Wetlands and Floodplains**

Section 404 of the Clean Water Act (CWA), federal regulations at 44 C.F.R. Part 9, and Executive Order 11990 (Protection of Wetlands) require a determination that there is no practical alternative to taking federal actions in waters of the United States or wetlands. Should there be no alternative, the federal actions should minimize the destruction, loss, or degradation of these resources and preserve and enhance their natural and beneficial values. Through analysis of the alternatives (See FS, Section 4), EPA has determined that because of the existence of wetlands at this Site (see Figure 1-5 of the FS) and the levels of Site-related waste that exists in these wetlands, there is no practicable alternative to conducting work in these areas. As required by the CWA, EPA has determined, through its analysis of the various alternatives, that the proposed cleanup alternatives which impact wetland areas are the least environmentally damaging practicable alternatives for protecting wetland resources. EPA will minimize potential harm and avoid adverse impacts to wetlands by using best management practices during excavation to minimize harmful impacts on the wetlands, wildlife or habitat, and by restoring these areas consistent with federal and state wetlands protection laws. Any wetlands affected by remedial work will be restored with native vegetation as a wetland area and such restoration will be monitored until the wetland vegetation becomes re-established. Other mitigation measures will be used to protect wildlife and aquatic life during remediation, as necessary.

Before EPA can select a cleanup alternative, Executive Order 11988 (Floodplain Management) and federal regulations at 44 C.F.R. Part 9 require EPA to make a determination that there is no practicable alternative to activities that affect or result in the occupancy and modification of the 100- and 500-year floodplain. Through its analysis of alternatives (See FS, Section 4), EPA has determined that the proposed cleanup will cause temporary impacts but will not result in the occupancy and modification of floodplains. Residential yards west of North Avenue are located within the 100-year and 500-year floodplains (see Figure 1-5 of the FS). While excavation and backfilling with clean soil is proposed for the Site properties located in floodplains, only temporary impacts to the floodplains are anticipated. Waste located within the floodplain will be excavated and backfilled with clean fill and restored to grade so that the current flood storage capacity of these areas and any adjacent wetland will not be diminished after completion of the proposed remedial actions. Best management practices will be used during construction, which include erosion control measures, proper regrading, and restoration and monitoring of impacted areas. More detail regarding wetland and floodplain management can be found in the FS.

Through this Proposed Plan, EPA is specifically soliciting public comments concerning its determination that the alternatives chosen are the least environmentally damaging practicable alternatives for protecting the Site wetland resources and that EPA's proposed cleanup plan is protective of floodplain resources.

### **Estimated Cost**

The estimated total present cost of this proposed cleanup plan, including construction, operation and maintenance, and long-term monitoring, is approximately \$22 million. Costs for all alternatives are presented in Table 2 and discussed in the FS in greater detail.

### **Potential Community Impacts**

Short-term impacts to site workers and the community include the potential inhalation of airborne contaminants during implementation of the soil excavation and installation of the PRB. Engineering control measures conducted during remediation activities, such as spraying soil with clean water, covering soil-filled trucks during excavation activities and transportation, and covering temporarily stockpiled soils at the W&L Property, will be

used to control any resulting dust. Particulate air monitoring will ensure that dust does not travel to nearby properties. The cleanup work will be performed during typical work hours to minimize noise in nearby residential areas. Other impacts to the community include trucking of excavated soils and supplies and materials to/from the remediation areas. Approximately 1,330 truck-loads of material will be taken off-site to a permitted disposal facility. During excavation, access to the area will be restricted to Site workers only. It is anticipated that three to four years will be needed to implement the site remedy. Groundwater restrictions in the non-drinking water areas are expected to be in place for over 100 years, until cleanup levels are achieved. Well restrictions to prevent the migration of contaminated groundwater from the non-drinking water areas of the Site to the Bungay River Water Resource Protection District are expected to be permanent. Refer to Figure 6 for more detail regarding property restrictions and Institutional Controls.

## **SITE DESCRIPTION AND HISTORY**

### **Site Description**

The Walton & Lonsbury metal plating facility was located on a 2.72-acre property at 78 North Avenue, Attleboro, Bristol County, Massachusetts. The W&L property is located in a mixed commercial/industrial area and is bounded to the north by Walton Street, to the south by wetlands and wooded areas ("southern wetland"), to the east by North Avenue with residences beyond, and to the west by industrial/commercial properties. The Site and general study area includes: the W&L property itself, inclusive of the two parcels immediately to the south; the wetland south of the W&L property (as far south as Deanville Road); the residential area immediately east of the W&L property along Paulette Lane and North Avenue; Bliss Brook and its banks, including residential yards that border the brook from the Paulette Lane area south to its confluence with the Bungay River; the Bungay River just upstream of its confluence with Bliss Brook; Mechanics Pond; and the stormwater piping that drains the wetland north of Deanville Road south to its discharge into Bliss Brook at West Street (see Figures 1 and 2).

### **Site History**

The W&L plating operations, primarily chromium plating, were performed in a 13,500 square-foot building on the property. Electroplating operations had been conducted at the property since 1940, and W&L performed chromium plating until it closed in 2007. Copper plating was also conducted at the facility until the building was remodeled in the late 1950s. Facility operations included parts degreasing using solvents, hard chrome plating, stripping with acids, aqueous rinsing, grinding, and polishing. Wastes typically generated from the hard chrome electroplating process include the following: spent plating bath solutions, spent degreasing solvents, spent acid and alkaline cleaning/dipping solutions, grinding residues, wastewater from rinsing of parts, and precipitated metals sludge from pre-treatment of wastewater prior to discharge.

From 1940 until 1970, wastewater and waste streams generated at the facility were directly discharged without treatment via an underground pipe from the plating room into the southern wetlands. The wetlands extend onto the southern abutting properties. In 1970, W&L abandoned and plugged its underground discharge pipe and installed a batch wastewater treatment system for metals removal and pH adjustment. Following startup of the treatment system, treated wastewater was discharged to a surface impoundment that was located west of the facility building. Wastewater flowing through the surface impoundment was then discharged to a storm water trench located on the west side of the facility building. The discharge from the storm water trench flowed through the wetland area, into several storm water culverts, and into the Ten Mile River. This practice continued until the mid-1980s. In addition, during the period of 1970 to the mid-1980s, chromium hydroxide sludges generated by the batch wastewater treatment system were discharged into an earthen sludge lagoon south of the surface impoundment for dewatering.

In 1984, W&L was ordered by the Massachusetts Department of Environmental Quality Engineering (MassDEQE) (now the Massachusetts Department of Environmental Protection (MassDEP)) to cease discharge to both the surface impoundment and the sludge lagoon. A closure plan was prepared and subsequently approved by MassDEQE. Sludge and visibly-contaminated soil were excavated and disposed off-site. The impoundment and lagoon were backfilled with clean sand and gravel and capped with a 6- to 12-inch clay cap, followed by loam and grass seed. The wastewater treatment system was converted to a closed-loop for process water, while chromium hydroxide sludge was accumulated and shipped off-site for disposal. Two above-ground storage tanks containing chlorinated solvents (TCE and 1,1,1-trichloroethane (1,1,1-TCA)) were located on the west side of the former building and supplied solvents for internal degreasing operations. Several overflow spills of solvents reportedly occurred during the early 1980s. An abandoned dry well located on the south side of the facility was reportedly used for the disposal of waste solvents. Three underground storage tanks were also present at the property and have all been removed.

## Study Areas

The W&L Superfund Site was listed on the NPL on May 21, 2013. The Site refers to the 78 North Avenue property (see Figure 2) and adjoining areas that were investigated during the Remedial Investigation and/or previous investigations, including: the wetland south of the 78 North Avenue property, as far south as Deanville Road; the residential area immediately east of the 78 North Avenue property along Paulette Lane and North Avenue; Bliss Brook and its banks, including residential yards that border the brook from the Paulette Lane area south to its confluence with the Bungay River; the Bungay River just upstream of its confluence with Bliss Brook; Mechanics Pond; and the stormwater piping that drains the wetland north of Deanville Road south to its discharge into Bliss Brook at West Street (see Figure 2). The study area also includes reference soil and sediment sampling locations that are nearby that were selected to be representative of conditions of similar habitat, but not impacted by releases from the W&L property.

## Prior Cleanup Actions

The W&L Property was initially investigated under the State cleanup program (the Massachusetts Contingency Plan or "MCP"). Walton & Lonsbury retained a consultant to perform MCP Phase I and II Investigations, but this work was not fully completed due to financial inability, and the W&L facility ceased all operations in 2007.

Subsequent investigations by EPA and MassDEP confirmed that metals (primarily chromium) and chlorinated VOCs (primarily TCE) were present in soil, groundwater, sediment, and surface water. VOCs were also detected in indoor air, likely due to vapor intrusion into buildings above or near the VOC plume. One home was equipped with an SSDS as a result, and two other homes were found to have existing radon mitigation systems determined to be effective in addressing vapor intrusion from VOCs.

In August 2010, the EPA Emergency Planning and Response Branch ("removal program") performed a preliminary assessment and site investigation (PA/SI) that documented the presence of chromic acid in on-property tanks, and high concentrations of metals were found in surface soils along Bliss Brook and in the backyards of several residences along Paulette Lane and North Avenue. EPA initiated a time-critical removal action in October 2010 to mitigate the ongoing human health exposures to metals-impacted soil and groundwater and to prevent potential future releases. Activities included removal of the W&L buildings and residual waste materials, excavation and off-site disposal of contaminated sediment from the southern wetland where wastewater was historically discharged, and construction of an engineered cover system to isolate surficial soils adjacent to Bliss Brook to mitigate future dermal contact risk. A PRB wall consisting of a mixture of ZVI was also constructed on the downgradient edge of the cover system with the goal of reducing hexavalent chromium to the less toxic trivalent chromium in groundwater prior to discharge into Bliss Brook.

## CURRENT AND FUTURE LAND USE

According to the zoning information from the City of Attleboro, the existing land use at the W&L property is zoned for industrial use. Future land use on the W&L property is expected to remain industrial. Residential areas lie to the south and east of the Site. The groundwater within the Site is not currently used as drinking water and the State has determined that the aquifer(s) within the Site are of low use and value. However, the State has determined that groundwater downgradient at the Site (the Bungay River Water Resource Protection District) is of medium use and value as a potential future drinking water source. This determination for the Site is consistent with an EPA-endorsed Comprehensive State Groundwater Protection Program.

| Walton & Lonsbury Site Timeline |   |
|---------------------------------|---|
| 1940                            | W&L built and began operating a chromium plating facility.  |
| 1970                            | W&L disconnected, plugged, and abandoned the untreated plating-wastewater discharge pipe, after the installation of a surface impoundment/lagoon treatment system.  |
| 1980                            | W&L received interim status as a Transportation, Storage, and Disposal (TSD) facility.  |
| 1984                            | W&L installed an industrial treatment system and closed the surface impoundment and sludge lagoon.  |
| 1985                            | A 1,000-gallon-capacity underground storage tank was removed from the Site.   |
| 1990-2001                       | W&L's consultant performed and completed an MCP Phase I Limited Site Investigation and Phase II Interim Comprehensive Site Assessment Report under State oversight.   |
| 2005                            | A Site Inspection Report was prepared for the EPA by Tetra Tech NUS which summarized past work done and included a reconnaissance of the W&L property and nearby residential neighborhoods, a survey of the wetlands and Bliss Brook, interviews, and collection of soil, sediment, surface water, and groundwater samples. |
| 2007                            | W&L facility and all operations ceased.   |
| 2008-2009                       | EPA's Office of Environmental Measurement and Evaluation (OEME) performed air sampling at nearby residences to assess the possibility of vapor intrusion; a vapor mitigation system was installed in one property by MassDEP.   |
| 2010                            | MassDEP's Field Assessment and Support Team (FAST) performed two vapor intrusion studies (one in February; one in December) at several additional properties.   |
| 2010                            | EPA Removal Program conducted a preliminary assessment and site investigation (PA/SI) in August 2010 and subsequently initiated a time-critical removal action in October 2010 to mitigate ongoing human health exposure and prevent potential future releases.   |
| 2010-2012                       | EPA Remedial Program Site Reassessment work was conducted and additional soil, sediment, and surface water sampling was performed to further assess the extent of chromium contamination.   |
| September 2012                  | EPA proposed the Site for listing on the National Priorities List (NPL).  |
| May 2013                        | EPA finalized the Site for inclusion on the NPL.  |
| 2014                            | Restoration activities for the removal action were completed in the summer of 2014.   |
| 2014-2016                       | Phases 1-4 of the remedial investigations were conducted, which involved soil sampling, subsurface and hydrogeological investigations, surface water and sediment investigations, ecological assessment, site surveys, and a vapor intrusion assessment.  |
| 2017                            | Phase 5 of the RI was conducted, which involved further sampling evaluation of lead in soil, and closure of data gaps for the overburden groundwater plume and its interaction with nearby surface water bodies.  |
| 2019                            | EPA completed the Remedial Investigation Report, Human Health and Ecological Risk Assessments, and Feasibility Study Report.  |
| July 2019                       | EPA released the proposed cleanup plan.   |

## WHY CLEANUP IS NEEDED

EPA has determined that there are both current and future potential threats to human health and the environment at the Site due to the historic chromium electroplating and other plating operations. Waste disposal practices primarily included discharge of untreated wastewater via an underground pipe. This is thought to have contaminated the wetlands south of the former facility and several of the residential yards along North Avenue abutting the wetlands, in part due to flooding. In addition, contaminants in overburden groundwater have migrated generally southeast under North Avenue toward the residential properties near Paulette Lane and subsequently discharged into the surface water of Bliss Brook. The presence of metals (primarily chromium and lead), chlorinated VOCs, polycyclic aromatic hydrocarbons (PAHs), and other contaminants have been identified throughout the Site at levels that present an unacceptable risk to human health and the environment.

### Site Contaminants

The main contaminants of concern (COCs) at the Site include, but are not limited to:

*Metals*, which are minerals that naturally occur in the Earth's crust and may be mobilized by industrial activities or releases. Metals present at the W&L Site include arsenic, chromium, lead, cobalt, and others. These metals were found in soil and groundwater at the Site, with chromium being found most frequently and widespread.

*Volatile Organic Compounds*, which include a variety of chemicals that are used in glue, paint, solvents, and other products, and easily evaporate. Common VOCs include trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), vinyl chloride, cis-1,2-dichloroethene (cis-1,2-DCE), and others. These compounds were found in the W&L site-wide groundwater and to some extent in soil.

*Polycyclic Aromatic Hydrocarbons*, which are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, and other organic substances like tobacco or charbroiled meat. Several PAHs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene, were detected in soil at the former W&L Property.

### How is Risk to People Expressed?

Every person has a baseline non-site related risk from exposure to the numerous naturally occurring and human made chemicals that are inherent in modern society. For example, the American Cancer Society estimates that 1 in 2 men, and 1 in 3 women, will develop cancer over a lifetime (Cancer Facts and Figures for 2016, American Cancer Society). While people also have baseline exposure to non-carcinogens through naturally occurring and human made chemicals that are inherent in modern society, these chemicals can result in toxic effects which are organ-specific, and therefore cannot be expressed in terms of probability.

In evaluating chemical exposure risk to humans, estimates for risk from carcinogens and non-carcinogens (chemicals that may cause adverse effects other than cancer) are expressed differently. EPA also considers the cumulative carcinogenic and non-carcinogenic effects when multiple chemical exposures with similar target endpoints are present.

For carcinogens, a chemical-specific daily intake level is first estimated and then multiplied with a cancer slope factor (CSF) or an inhalation unit risk (IUR) to estimate excess lifetime cancer risk. CSF and IUR values are developed by EPA scientists based on epidemiological and/or animal studies to measure potency estimates of a chemical's ability to cause cancer. Cancer risk estimates are expressed in terms of probability. For example, exposure to a particular site-related carcinogenic chemical may present a 1 in 1,000,000 increased chance of causing cancer over an estimated lifetime of 70 years. This can also be expressed as one-in-a-million or  $10^{-6}$  excess lifetime cancer risk. The EPA acceptable risk range for carcinogens is  $10^{-6}$  (1 in 1,000,000) to

$10^{-4}$  (1 in 10,000) in a 70-year lifetime. In general, site-related cancer risks in excess of this range are considered unacceptable and would require being addressed by the Superfund cleanup.

For non-carcinogens, exposures are first estimated and then compared to a reference dose (RfD) or a reference concentration (RfC) for inhalation. RfD and RfC values are developed by EPA scientists based on epidemiological and/or animal studies as estimates of a daily exposure to a person, including the most sensitive person, that is likely to be without an appreciable risk of an adverse health effect when exposure occurs over the duration of a lifetime. The exposure dose or concentration is divided by the RfD or RfC value to calculate the ratio known as a hazard index (HI) for measuring whether non-cancer adverse health effects would likely occur or not. In general, HI values based on site-related exposure in excess of 1.0 is considered unacceptable and would require being addressed by the Superfund cleanup.

For lead, because of uncertainties in the dose-response relationship, there is no EPA-derived RfD for lead. Therefore, EPA uses a model called the Integrated Exposure Uptake Biokinetic ("IEUBK") Model to evaluate potential risks from exposure to lead in soil. For example, the model predicts the probability that a child (under the age of seven) will have a blood lead level greater than the level associated with adverse health effects. EPA's goal is to limit soil lead exposure such that a child or group of children would have an estimated risk of no more than 5% of the population exceeding a target blood lead level of 5 µg/dL.

## Exposure Pathways & Potential Risk

Just because contamination exists does not mean people or the environment are at risk. There has to be exposure to a contaminant to have a potential risk. If there is no exposure, there is no potential risk. Exposure occurs when people or other living organisms eat, drink, breathe, or have direct skin contact with a hazardous substance or waste material. Based on existing or reasonably anticipated future land use at a site, EPA develops different possible exposure scenarios to determine potential risk, appropriate cleanup levels for contaminants, and potential cleanup approaches, all of which are documented in the FS.

Human health and ecological risk assessments have been prepared for the Site (detailed risk summaries can be found in the May 2019 Final Baseline HHRA and ERA, and Appendix A of the FS). These conservative assessments use a number of possible contamination exposure scenarios to determine if and where there are current or potential future unacceptable risks to humans and/or the environment.

## Human Health Risks

People have the potential for exposure to Site contaminants through the following exposure pathways: drinking and direct contact with groundwater; direct contact with soils and surface water; and inhalation of vapors emanating from groundwater contamination. Further discussion of the exposure pathways is presented below.

## Exposure Assessment

The exposure assessment characterizes the physical setting of the Site and evaluates the exposures that may be experienced by a receptor population. To have an exposure, several factors must be present: a source of contamination, a mechanism through which a receptor can come into contact with the contaminants in that medium, and a potential or actual receptor present at the point of contact.

Current Site land use is varied, with the W&L property zoned industrial, and residential use elsewhere. Residential use refers to use of property for the location of residential dwellings, with the assumption that young children and adults spend the majority of their time each day in the residential dwelling at their property.

Residential land uses are assumed to involve exposure to soil and use of groundwater as both a drinking water and non-drinking water source (e.g. for watering plants).

Health risks were evaluated for other possible current and future uses of the Site, including recreational use, construction/utility worker scenario, and industrial/commercial use. Recreational use refers to land uses that involve leisure and sporting activities such as walking, hiking, picnicking, or nature study. The recreational use scenario evaluated young children and adults who were assumed to be exposed to soil, as well as to surface water and sediment if wading activities occur. The construction/utility worker scenario evaluated the potential for direct contact with soil, shallow groundwater, and inhalation of vapors during trenching, digging foundations, and other such activities.

Based on the results of the HHRA, EPA found that the following pathways pose unacceptable human health risks because the calculated risks exceed EPA's acceptable cancer risk range of  $10^{-6}$  to  $10^{-4}$ , the non-cancer Hazard Index of 1, and/or EPA's risk-based standard for lead:

- Current and future recreational users exposed to surface water at the Bliss Brook exposure point, due to hexavalent chromium;
- Future residents exposed to surface/subsurface soil at the W&L property<sup>1</sup>, due primarily to hexavalent chromium, lead, and PAHs;
- Future construction/utility workers exposed to shallow groundwater at the W&L property, due to hexavalent chromium;
- Future residents exposed to Site-wide groundwater, due primarily to hexavalent chromium and VOCs (e.g., TCE and vinyl chloride); and
- Current and future residents exposed to surface soil at the residential yards west of North Avenue, due to lead.

The presence of elevated sub-slab soil gas concentrations of VOCs (presumably from groundwater and/or soil) at the W&L property indicates a need for further evaluation of the future vapor intrusion pathway if any new building is constructed at the W&L property, or if there is a change in conditions to existing buildings overlying the contaminated shallow groundwater plume that may increase the potential for vapor intrusion to occur.

The detailed evaluation of the potential human health risks is presented in the Final Human Health Risk Assessment, dated May 2019. This was used to develop the cleanup alternatives presented in the Final FS.

## Threats to the Environment

A screening-level ecological risk assessment (SLERA) was initially performed using available surface water, sediment, and soil analytical data. The SLERA identified many chemicals of potential concern in all of the aquatic and terrestrial habitats evaluated as potentially affected by the Site. This prompted further investigation of the degree and extent to which there may be ecological risk in these habitats.

A Baseline Ecological Risk Assessment (BERA) was performed to evaluate the risk to ecological receptors potentially affected by the Site. Three exposure areas (EA) within the areas of investigation were utilized for the purposes of the BERA based on habitat types, contaminant fate and transport pathways, and hydrogeology.

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<sup>1</sup> A future residential scenario at the W&L property was evaluated as part of the baseline HHRA to determine any potential risk(s). Remedial alternatives to address unacceptable risk to future residents from surface/subsurface soil and groundwater at the W&L property were evaluated in the FS. However, these alternatives are not carried forward in this Proposed Plan, as the current and reasonably anticipated future land use of the W&L property is industrial. However, Institutional Controls to prohibit future residential use of the property are warranted.

These EAs are: 1) the W&L Property and Southern Wetland; 2) Bliss Brook; and 3) Mechanics Pond (including a short segment of the Bungay River). The potential receptors evaluated in the BERA included: 1) aquatic receptors (e.g., invertebrates, fish, and amphibians) living in the affected waterways; 2) benthic invertebrates in affected sediments; 3) invertebrates and plants exposed to soils affected by Site contaminants; and 4) wildlife receptors (birds and mammals) exposed via the food chain to Site-related contamination in the sediments or soils.

The ecological receptors were evaluated at each EA using a series of measurement endpoints. These endpoints are measurable ecological characteristics, quantified through laboratory or field experimentation, which could be related back to the ecological resources selected as the endpoints. The endpoints used in the BERA included comparison of Site-related contaminant concentrations to established media-specific benchmarks; food chain modeling; and site-specific laboratory toxicity testing.

Overall, the BERA concluded that there is severe risk to aquatic receptors (e.g., invertebrates, amphibians, fish) in Bliss Brook primarily from exposure to hexavalent chromium in surface water. Thus, this unacceptable risk is included in the evaluation of response actions. Details of the ecological risk assessment can be found in the Final Baseline Ecological Risk Assessment dated May 2019.

## Principal Threat Waste

The National Contingency Plan (NCP), which governs EPA cleanups, at 40 C.F.R. § 300.430(a)(1)(iii), states that EPA expects to use “treatment to address the principal threats posed by a site, wherever practicable” and “engineering controls, such as containment, for waste that poses a relatively low long-term threat” to achieve protection of human health and the environment. This expectation is further explained in an EPA fact sheet (OSWER #9380.3-06FS), which states that principal threat wastes are source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Low-level threat wastes are source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

The concept of principal threat and low-level threat waste is applied on a site-specific basis when characterizing source material. Source material is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, air, or act as a source of direct exposure.

Although EPA has not established a threshold level of toxicity/risk to identify a principal threat waste, generally where toxicity and mobility combine to pose a carcinogenic risk of  $10^{-3}$  or greater, the source material is considered principal threat waste. Significantly-contaminated soil within the source area (the former W&L facility footprint and area just to the south, approximately 14,000 square feet) acting as a continuing source of contamination to groundwater constitutes as principal threat waste.

It is EPA’s current judgment that the preferred alternative identified in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances, including principle threat waste, into the environment and that treatment of the principle threat waste has been included as a component of the preferred alternative to the extent practicable.

## CLEANUP ALTERNATIVES CONSIDERED

Once possible exposure pathways and potential risks have been identified at a site, cleanup alternatives are developed to reduce and/or mitigate the identified unacceptable risks and achieve the site-specific Remedial Action Objectives (RAOs), which are also known as the cleanup objectives. The RAOs for the W&L Site are as follows:

- Prevent exposure by future construction workers to the W&L property groundwater containing Site contaminants that would result in a total excess lifetime cancer risk greater than the target risk range of  $10^{-6}$  to  $10^{-4}$ , and/or a non-cancer Hazard Index greater than 1.
- Prevent exposure by current and future residents to surface soil containing lead that would result in estimated risk of greater than 5% of the youth population exceeding a target blood lead level of 5 µg/dL.
- Prevent exposure to Site-wide groundwater containing Site contaminants that would result in a total excess lifetime cancer risk greater than the target risk range of  $10^{-6}$  to  $10^{-4}$ , and/or a non-cancer Hazard Index greater than 1 for non-drinking water scenarios (e.g., irrigation, swimming pools, etc.).
- Prevent or minimize further migration of Site contaminants in Source Area soil and overburden groundwater within the W&L property into the downgradient contaminated groundwater plume and discharging into Bliss Brook.
- Prevent or minimize further migration of Site-wide groundwater containing Site-contaminants, located within the compliance boundary for the defined on-Site non-drinking water aquifer, into the downgradient Bungay River Water Resource Protection District to protect its beneficial use as a potential future drinking water source.
- Prevent exposure by future building occupants to indoor air vapors, via a vapor intrusion pathway, containing Site contaminants that would result in a total excess lifetime cancer risk greater than the target risk range of  $10^{-6}$  to  $10^{-4}$ , and/or a non-cancer Hazard Index greater than 1.
- Prevent exposure by current and future recreational users to Bliss Brook surface water containing Site contaminants that would result in a total excess lifetime cancer risk greater than the target risk range of  $10^{-6}$  to  $10^{-4}$ , and/or a non-cancer Hazard Index greater than 1.
- Prevent exposure by current and future ecological receptors to Bliss Brook surface water containing Site contaminants that would result in potential adverse impacts.

Table 1 presents the proposed site contaminant cleanup levels, or Preliminary Remediation Goals (PRGs), and the basis for selection, for each exposure scenario described above found to pose an unacceptable risk to human health or the environment.

### Soil in Residential Yards West of North Avenue Alternatives<sup>2</sup>

#### Alternative SL-1: No action

- As a baseline to compare against other alternatives, no action would be taken to address contamination at the W&L property. No construction would take place, and RAOs would not be achieved.

#### Alternative SL-3: Excavation of surface soil with off-site disposal (EPA's preferred alternative)

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<sup>2</sup> Alternative SL-2, Institutional Controls and Soil Capping on Residential Properties, was screened out from further evaluation in the FS due to: 1) contaminants would remain on the properties above the risk-based cleanup levels; 2) it would restrict a homeowner's use of the property; and 3) capping may result in net filling within the floodplain and decrease flood storage.

- Excavation of approximately 310 cubic yards of lead-contaminated soil with concentrations in excess of proposed risk-based cleanup levels from six residential properties;
- Utilize erosion control measures (e.g., hay bales and silt fences) and perform dust control and air monitoring as necessary during excavation;
- Off-site disposal of all excavated material at an appropriate off-site permitted facility; and
- Excavated areas will be restored with clean, imported backfill to grade and re-vegetated with native vegetation to control erosion and restore any altered wetland/floodplain habitat.

## Overburden Groundwater/Surface Water Alternatives

### GW/SW-1: No action

- As a baseline to compare against other alternatives, no action would be taken to address contamination in Site groundwater and surface water. No construction would take place, and RAOs would not be achieved.

### GW/SW-2A: Source Area soil removal with *in-situ* soil treatment and groundwater pump and treat

- Removal and off-site disposal of approximately 730 cubic yards of the remaining building concrete floor slab and the cobble-filled "pit" to allow for removal of underlying contamination;
- Excavation of approximately 7,900 cubic yards down to a maximum depth of 15 feet bgs of significantly-contaminated soil within the source area and off-site disposal in a permitted facility;
- Soil blending with reactive media ZVI within the open excavation area (approximately 15 to 30 feet bgs) down to the top of bedrock;
- Backfill with additional reactive media (ZVI) and sand blend to 7.5 feet bgs or the water table (whichever is higher), with clean sand and graded topsoil backfilled to ground surface;
- De-watering the portion of the excavation that extends below the water table, and any excavated soils that require dewatering, collect the water in tanks and treat on-site as needed to meet surface water standards for discharge to Bliss Brook (or as appropriate off-site disposal at a permitted facility);
- Construction and operation of a groundwater pump and treat system in the area just south of the engineered cover system to intercept and treat the overburden groundwater plume to prevent continued discharge of contaminated groundwater to surface water in Bliss Brook;
- Treated groundwater would be discharged into Bliss Brook upstream of the recovery system;
- Long-term monitoring of the overburden groundwater plume, surface water in Bliss Brook, and existing buildings with SSDs or which may have the potential for vapor intrusion, to evaluate remedy effectiveness;
- Maintenance of any new and existing remedy infrastructure components, including the existing engineered cover system and PRB, existing SSDs, and the pump and treat system;
- Institutional Controls to 1) prohibit future residential use at the W&L Property 2) prevent future construction worker exposure to groundwater contamination at the W&L property; 3) prevent contact with contaminated groundwater and the installation of non-drinking water wells (*i.e.*, irrigation wells) across the extent of the site-wide groundwater plume where non-drinking water scenario cleanup levels for residential groundwater are exceeded and/or which may cause migration of the contaminated plume; 4) prevent disturbance of the existing engineered cover system and PRB, and any new remedy infrastructure components; 5) prevent contact with soil beneath the existing engineered cover system adjacent to Bliss Brook; and 6) require either a vapor intrusion evaluation or vapor mitigation system be installed if a new building is constructed over the shallow groundwater VOC plume (within or to the downgradient neighborhood of the former building on the W&L Property); and

- Periodic five-year reviews to assess remedy protectiveness.

GW/SW-2B: Source Area soil removal with *in-situ* soil treatment and groundwater pump and treat with mid-plume *in-situ* treatment

- All of the components described in Alternative GW/SW-2A, with the following additional component:
- Mid-plume *in-situ* soil treatment via a series of borehole wells filled with reactive media down to the top of bedrock, approximately 200 feet in length running north-south along North Avenue, to intercept the middle of the hexavalent chromium and chlorinated VOC overburden groundwater plumes.

GW/SW-3A: Source Area soil removal with *in-situ* soil treatment and extension of permeable reactive barrier

- Removal and off-site disposal of approximately 730 cubic yards of the remaining building concrete floor slab and the cobble-filled "pit" to allow for removal of underlying contamination;
- Excavation of approximately 7,900 cubic yards down to 15 feet bgs of significantly-contaminated soil within the source area and off-site disposal at a permitted facility;
- Soil blending with reactive media ZVI within the open excavation area down to the top of bedrock;
- Backfill with additional reactive media (ZVI) and sand blend to 7.5 feet bgs or the water table (whichever is higher), with additional clean sand and graded topsoil backfilled to ground surface;
- De-watering the portion of the excavation that extends below the water table, and any excavated soils that require dewatering, collect the water in tanks and treat on-site as needed to meet surface water standards for discharge to Bliss Brook (or an appropriate off-site disposal at a permitted facility);
- Construction of a new PRB filled with reactive media to augment the existing PRB intercepting the overburden groundwater plume prior to discharge into Bliss Brook;
- Excavation of approximately 4,400 cubic yards of soil in order to construct the PRB and disposal at an off-site permitted facility;
- Restoration with native vegetation of any wetland/floodplain habitat altered by the remedial action;
- Long-term monitoring of the overburden groundwater plume, surface water in Bliss Brook, and existing buildings with SSDs or which may have the potential for vapor intrusion, to evaluate remedy effectiveness;
- Maintenance of any new and existing remedy infrastructure components, including the engineered cover system and PRB, existing SSDs, and periodic replacement/regeneration of reactive media in the PRB;
- Institutional Controls to 1) prohibit future residential use at the W&L Property 2) prevent future construction worker exposure to groundwater contamination at the W&L property; 3) prevent contact with contaminated groundwater and the installation of non-drinking water wells (*i.e.* irrigation wells) across the extent of the site-wide groundwater plume where non-drinking water scenario cleanup levels for residential groundwater are exceeded and/or which may cause migration of the contaminated plume; 4) prevent disturbance of the existing engineered cover system and PRB, and any new remedy infrastructure components; 5) prevent contact with soil beneath the existing engineered cover system adjacent to Bliss Brook; and 6) require either a vapor intrusion evaluation or vapor mitigation system be installed if a new building is constructed over the shallow groundwater VOC plume (within or to the downgradient neighborhood of the former building on the W&L Property); and
- Periodic five-year reviews to assess remedy protectiveness.

GW/SW-3B: Source Area soil removal with *in-situ* soil treatment and extension of permeable reactive barrier with mid-plume *in-situ* treatment (EPA's preferred alternative)

- All of the components described in Alternative GW/SW-3A, with the following additional component:

- Mid-plume *in-situ* soil treatment via a series of borehole wells filled with reactive media down to the top of bedrock, approximately 200 feet in length running north-south along North Avenue, to intercept the middle of the hexavalent chromium and chlorinated VOC overburden groundwater plumes.

## Bedrock Groundwater Alternatives

### BR-1: No Action

- As a baseline to compare against other alternatives, no action would be taken to address contamination in Site bedrock groundwater. No construction would take place, and RAOs would not be achieved.

### BR-2: Institutional Controls

- Institutional Controls to 1) prevent contact with contaminated groundwater and the installation of non-drinking water (*i.e.* irrigation) wells within the bedrock plume boundary until groundwater cleanup goals are achieved; and 2) prevent the installation of wells within the potentially impacted portion of the Bungay River Water Resource Protection District to prevent plume migration from the contaminated non-drinking water area into the District;
- Pre-design investigation sampling to further refine the horizontal and vertical extent of the contaminated bedrock plume so that the area potentially requiring additional remedial action can be defined;
- Monitoring of the site-wide bedrock groundwater contaminant plume to evaluate the attenuation of hexavalent chromium and chlorinated VOCs until groundwater cleanup standards are achieved;
- Periodic five-year reviews to assess remedy protectiveness;
- Contingency to prevent migration and restore groundwater to drinking water standards solely within the Bungay River Water Resource Protection District, if groundwater contaminants are found to exceed federal and state drinking water standards upon further investigations. If standards are exceeded:
  - Downgradient monitoring of the bedrock groundwater contaminant plume until groundwater cleanup standards are achieved; and
  - Institutional Controls to 1) prevent contact with and consumption of contaminated groundwater within the contaminated areas of the District until groundwater cleanup standards are achieved; and 2) maintain the integrity of any new remedy infrastructure components. There will be a permanent well restriction zone established along the border of the non-drinking water aquifer and the District to prevent the installation of wells that might draw contaminated groundwater into the District.

### BR-3: Institutional Controls, and contingency remedy of focused *in-situ* injections (EPA's preferred alternative)

- The first four components described in Alternative BR-2, with the following additional contingency components to prevent migration from the contaminated non-drinking water area into the District and restore groundwater to drinking water standards solely within the Bungay River Water Resource Protection District, if groundwater contaminants are found to exceed federal and state drinking water standards upon further investigations:
  - Focused *in-situ* bedrock injection treatment line approximately 200 feet in length along the west of North Avenue via a series of borehole wells installed 10 feet into bedrock and injected with reactive media (ZVI) to reduce the toxicity of hexavalent chromium and chlorinated VOCs;
  - Downgradient monitoring of the bedrock groundwater contaminant plume until groundwater cleanup standards are achieved;

- Institutional Controls to 1) prevent contact with and consumption of contaminated groundwater within the contaminated areas of the District until groundwater cleanup standards are achieved; and 2) maintain the integrity of any new remedy infrastructure components. There will be a permanent well restriction zone established along the border of the non-drinking water aquifer and the District to prevent the installation of wells that might draw contaminated groundwater into the District.

#### BR-4: Institutional Controls, and contingency remedy of pump and treat

- The first four components described in Alternative BR-2, with the following additional contingency components to prevent migration from the contaminated non-drinking water area into the District and restore groundwater to drinking water standards solely within the Bungay River Water Resource Protection District, if groundwater contaminants are found to exceed federal and state drinking water standards upon further investigations:
  - Construction and O&M of a groundwater pump and treat system along Bliss Brook to intercept and treat the bedrock groundwater contaminant plume;
  - Treated groundwater would be discharged into Bliss Brook upstream of the recovery system;
  - Downgradient monitoring of the bedrock groundwater contaminant plume until groundwater cleanup standards are achieved;
  - Institutional Controls to 1) prevent contact with and consumption of contaminated groundwater within the contaminated areas of the District until groundwater cleanup standards are achieved; and 2) maintain the integrity of any new remedy infrastructure components. There will be a permanent well restriction zone established along the border of the non-drinking water aquifer and the District to prevent the installation of wells that might draw contaminated groundwater into the District.

#### BR-5: Institutional Controls, and contingency remedy of enhanced (deeper) permeable reactive barrier

- The first four components described in Alternative BR-2, with the following additional contingency components to prevent migration from the contaminated non-drinking water area into the District and restore groundwater to drinking water standards solely within the Bungay River Water Resource Protection District, if groundwater contaminants are found to exceed federal and state drinking water standards upon further investigations:
  - Construction of an enhanced (deeper) PRB over a distance of approximately 300 feet along Bliss Brook via a series of borehole wells installed 10 feet into bedrock and injected with reactive media (ZVI) to reduce the toxicity of hexavalent chromium and chlorinated VOCs;
  - Downgradient monitoring of the bedrock groundwater contaminant plume until groundwater cleanup standards are achieved;
  - Institutional Controls to 1) prevent contact with and consumption of contaminated groundwater within the contaminated areas of the District until groundwater cleanup standards are achieved; and 2) to maintain the integrity of any new remedy infrastructure components. There will be a permanent well restriction zone established along the border of the non-drinking water aquifer and the District to prevent the installation of wells that might draw contaminated groundwater into the District.

## THE NINE CRITERIA FOR CHOOSING A CLEANUP PLAN

EPA uses nine criteria to evaluate cleanup alternatives and select a final cleanup plan. EPA has already evaluated how well each of the cleanup alternatives developed for the Walton & Lonsbury Superfund Site meet the first seven criteria in the Feasibility Study. Once comments from the community and state are received and

considered, EPA will select the final cleanup plan and document its selection in the Record of Decision (ROD) for the Site.

1. Overall protection of human health and the environment: Will it protect you and the plant and animal life on and near the site? EPA will not choose a cleanup plan that does not meet this basic criterion.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs): Does the alternative meet all federal environmental and state environmental and facility siting statutes and regulations that are either applicable or relevant and appropriate to the selected cleanup plan? The cleanup plan must meet this criterion.
3. Long-term effectiveness and permanence: Will the effects of the cleanup plan last or could contamination cause future risk?
4. Reduction of toxicity, mobility, or volume through treatment: Using treatment, does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?
5. Short-term effectiveness: How soon will site risks be adequately reduced? Could the cleanup cause short-term hazards to workers, residents, or the environment?
6. Implementability: Is the alternative technically feasible? Are the right goods and services (i.e. treatment equipment, space at an approved disposal facility) available?
7. Cost: What is the total cost of an alternative over time? EPA must select a cleanup plan that provides necessary protection for a reasonable cost.
8. State acceptance: Do state environmental agencies agree with EPA's proposal?
9. Community acceptance: What support, objections, suggestions, or modifications did the public offer during the comment period?

## Cleanup Alternatives Comparison

The alternatives for Soil in Residential Yards West of North Avenue, Overburden Groundwater and Surface Water, and Bedrock Groundwater were compared to each other to identify how well each alternative meets EPA's evaluation criteria. The State and Community Acceptance criteria will be evaluated once feedback is received during the public comment period. The following discussion and Table 2 present a general and cost comparison summary of the alternatives against EPA evaluation criteria for each cleanup component. Detailed evaluations and comparisons of alternatives are included in Section 5.0 of the FS. The cleanup objectives (RAOs) for the Site are listed above.

## Soil in Residential Yards West of North Avenue

### Overall Protection of Human Health and the Environment

Alternative SL-1 (No Action) offers no protection of human health or the environment, and risks to current and future residential users from direct exposure to contaminated soil would remain. Alternative SL-3 is expected to provide protection of human health and environment by eliminating risks to human health from direct exposure to lead since no soil with contaminants in excess of cleanup levels would remain.

### Compliance with ARARs

The No Action Alternative (SL-1) would not meet chemical-specific ARARs since it does not prevent exposure to contaminated soil. No activities would be performed under SL-1, thus action-specific and location-specific ARARs do not apply to this alternative. SL-3 (soil excavation and off-site disposal) will comply with the chemical-specific, action-specific, and location-specific ARARs (See Tables E-3; and E-4a, -4b, and -4c of the FS). Remedial activities may impact the wetlands during excavation of contaminated soil. However, EPA has made a draft determination that Alternative SL-3 is the least environmentally damaging practicable alternative under the federal Clean Water Act for protecting the wetland areas because it will permanently remove contamination

from wetland areas and then will restore the areas with native wetland vegetation. Work in the 100- and 500-year floodplains will occur with Alternative SL-3 and will result in temporary occupancy and modification of the floodplain. However, upon completion of the excavation work, the area will be backfilled to the original grade to avoid loss of flood storage capacity. As required by federal floodplain regulations, EPA has made a draft determination that there was no other practicable alternative to address contamination within the floodplain before selecting this alternative as the preferred remedy. Any impacts to floodplain resources will be minimized and any damage mitigated.

Public comment is being solicited through this Proposed Plan on EPA's draft wetland and floodplain determinations.

### **Long-term Effectiveness and Permanence**

Alternative SL-3 permanently removes all soil with lead concentrations above the cleanup levels allowing for unrestricted use, while contaminated soil would remain under SL-1. SL-1 does not provide permanent protection from contaminants in soil and is not effective.

### **Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment**

No treatment is provided for in Alternatives SL-1 and SL-3, and thus no reduction in TMV through treatment is provided.

### **Short-term Effectiveness**

The No Action Alternative (SL-1) will not be effective in the short-term in protecting human health or the environment, but because no remedial activities will occur, there will be no adverse impacts to the public or workers performing the cleanup. There are no short-term impacts to natural habitats under SL-1. Alternative SL-3 includes short-term risks to workers and the community during excavation activities. These risks would be mitigated with the use of appropriate PPE during remedial activities, dust control, and proper handling and management of contaminated soil. SL-3 will result in temporary removal of existing vegetation and possibly some trees. Work would be designed to minimize impacts to wetland and floodplain areas, however short-term impacts are possible that will be addressed through mitigation measures, as necessary.

Alternative SL-1 would not achieve RAOs, while Alternative SL-3 would meet RAOs. It is anticipated to take approximately six months to implement Alternative SL-3.

### **Implementability**

The No Action Alternative (SL-1) is the easiest to implement because no remedial activities are required. Alternative SL-3, the only other alternative considered for remediation of residential soil, is not considered highly complex and has been frequently and readily implemented at similar environmental restoration sites. SL-3, which involves excavation and off-site disposal, employs a technically reliable, proven technology. With adequate planning, it is anticipated that this alternative can be completed quickly and without technical problems.

### **Costs**

Except for the cost of five-year reviews, there is no cost estimated as part of the No Action SL-1 Alternative. SL-3, the only other alternative considered for remediation of residential soil, has a higher cost in comparison to SL-1 due to the volume of soil to be excavated and disposed of. The costs for the alternatives are presented in Table 2.

## Overburden Groundwater/Surface Water

### Overall Protection of Human Health and the Environment

The No Action Alternative (GW/SW-1) provides no protection of human health or the environment. Risks to construction workers, ecological receptors, and recreational users would remain.

Alternatives GW/SW-2a and GW/SW-2b are protective of human health and environment because the full extent of impacted overburden groundwater would be either contained by the pump and treat extraction wells or be under the regulation of institutional controls, in addition to the source removal and control on the W&L property. They are also protective of human health and the ecosystem of Bliss Brook because the pump and treat technology would intercept and treat the hexavalent chromium groundwater plume prior to discharge into Bliss Brook and the existing engineered cover system and PRB, which also addressed Bliss Brook discharges, would also be maintained.

Alternatives GW/SW-3a and GW/SW-3b are protective of human health and the environment because the existing engineered cover system would be maintained and the existing PRB would be extended further south to fully capture the hexavalent chromium groundwater plume and reduce it to trivalent chromium before discharge into Bliss Brook, in addition to the source removal and control on the W&L property. They are also protective of human health and the ecosystem of Bliss Brook because the PRB technology would intercept and treat the hexavalent chromium groundwater plume prior to discharge into Bliss Brook.

For Alternatives GW/SW-2a and -2b and GW/SW-3a and -3b, Institutional Controls would be established to prevent exposure to contaminated groundwater, protect the respective remedy components of each alternative, and address the potential for future vapor intrusion.

### Compliance with ARARs

The No Action GW/SW-1 Alternative would not meet chemical-specific ARARs since it does not prevent exposure to contaminated soil, groundwater, or surface water. No activities would be performed under GW/SW-1, thus action-specific and location-specific ARARs do not apply to this alternative. Alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b will comply with all ARARs (See Tables E-6a, -6b, -6c, and E-7a, -7b, and -7c in the FS).

Alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b all need to meet specific wetland and floodplain ARAR requirements due to each having impacts to wetland and floodplain resources. Alternatives GW/SW-3a and GW/SW-3b have slightly more impacts to the wetlands and floodplains due to each including installation of the PRB extension through wetlands and floodplain, while impacts from Alternatives GW/SW-2a and GW/SW-2b involve primarily maintenance of existing remedy infrastructure (the engineered cover system and the existing PRB). Work in floodplains will result in temporary occupancy and modification of the floodplain; upon completion, the area will be backfilled to the original grade to avoid loss of flood storage capacity. EPA has made a draft determination that Alternative GW/SW-3b is the least environmentally damaging practicable alternative under the federal Clean Water Act for protecting the wetland areas because it will permanently remove contamination from wetland areas and then will restore the areas with native wetland vegetation. Work in the 100- and 500-year floodplains will occur with Alternative GW/SW-3b and will result in temporary occupancy and modification of the floodplain. However, upon completion of the excavation work, the area will be backfilled to the original grade to avoid loss of flood storage capacity. As required by federal floodplain regulations, EPA has made a draft determination that there was no other practicable alternative to address contamination within the floodplain before selecting this alternative as the preferred remedy. Any impacts to floodplain resources will be minimized and any damage mitigated.

Any wastes generated by remedial activities for the alternatives (except GW/SW-1) will be managed on-site in compliance with ARARs until disposed of at a permitted off-site disposal facility. Any water generated during soil excavation (all alternatives except GW/SW-1) and de-watering activities will be treated prior to discharge to surface waters or disposed of off-site as appropriate.

### **Long-term Effectiveness and Permanence**

The No Action GW/SW-1 Alternative is the least effective alternative for long-term effectiveness and permanence because the risks identified in the baseline HHRA and ERA are not addressed. For alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b, soil above the water table containing hexavalent chromium is permanently removed from the Site; soil below the water table containing hexavalent chromium will be converted to the less toxic and less mobile trivalent chromium by *in-situ* soil blending with reactive media. For Alternatives GW/SW-2a and GW/SW-2b, the pump and treat system near Bliss Brook would permanently remove and treat groundwater impacted with hexavalent chromium that would enter Bliss Brook. However, in order for the pump and treat alternatives to have long-term effectiveness, a continuous effort to operate the system is required. For Alternatives GW/SW-3a and GW/SW-3b, the PRB would convert hexavalent chromium to the less toxic and less mobile trivalent chromium. The PRB does not require any day-to-day operation or maintenance; however, over time the reactive media within the barrier may become spent and require replacement. Overall, because Alternatives GW/SW-2a and GW/SW-2b rely on the effective day-to-day operations of the pump and treat system, these alternatives receive a lower rating compared to Alternatives GW/SW-3a and GW/SW-3b, which retain long-term effectiveness without day-to-day operational requirements.

Residual risks for all the alternatives (except GW/SW-1) would be low because incremental risks from COCs in groundwater and surface water would be mitigated through institutional controls to prevent exposure to contaminated groundwater and groundwater contaminant levels would decline over time as a result of the pump and treat or PRB treatment processes until groundwater cleanup standards are achieved. Alternatives GW/SW-2b and GW/SW-3b include the mid-plume *in-situ* treatment component, which would provide a degree of additional treatment of hexavalent chromium and TCE and would require minimal O&M.

### **Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment**

Alternative GW/SW-1 does not include any treatment, and thus provides no reduction in TMV through treatment. For Alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b, TMV would be reduced by greater than 95% on the W&L property due to the introduction of a soil amendment into the source area excavation, which will reduce hexavalent chromium to the less toxic and less mobile trivalent chromium. The existing PRB would also continue to treat groundwater contamination before it reached the Brook. For alternatives GW/SW-2b and GW/SW-3b, TMV would be further reduced due to the mid-plume *in-situ* treatment component. Alternatives GW/SW-3a and GW/SW-3b would treat all overburden groundwater before it discharges into the Brook through the existing and extended PRB. Alternatives GW/SW-2b and GW/SW-3b receive the same rating as the other alternatives (GW/SW-2a and GW/SW-3a).

### **Short-term Effectiveness**

The No Action GW/SW-1 Alternative will not be effective in the short-term in protecting human health or the environment, but because no remedial activities will occur, there will be no adverse impacts to the public or workers performing the cleanup. Alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b include short-term risks to workers and to the community during remedial activities but these risks would be mitigated via dust control, proper traffic planning, and engineering controls. The short-term worker risks associated with these alternatives can be mitigated with the use of appropriate PPE during remedial activities, dust control, and proper handling and management (*i.e.*, engineering controls and contingency measures) of contaminated soil and groundwater. Transfer lines for impacted and treated water as well as electrical service

would be required as part of the pump and treat alternatives (GW/SW-2a and GW/SW-2b). Installation of these utilities may create temporary inconvenience to the community. Failure of the transfer lines or groundwater containment systems, although rare, creates a potential for impact to the community. Alternatives GW/SW-3a and GW/SW-3b include more extensive work adjacent to and in Bliss Brook and its associated wetlands and floodplain. The ecosystem of Bliss Brook would be impacted during construction, but wetland and floodplain habitat restoration would be conducted and will take approximately one year for the Brook to become re-established. The addition of the mid-plume *in-situ* treatment line in Alternatives GW/SW-2b and GW/SW-3b would work to reduce the time to achieve cleanup levels. The pump and treat alternatives present a slightly greater impact to the community during construction and the PRB wall alternatives present a slightly greater impact to the ecosystem of Bliss Brook. Thus, the short-term impacts are rated equally.

Alternative GW/SW-1 would not achieve RAOs.

### **Implementability**

The No Action GW/SW-1 Alternative is the easiest to implement because no remedial activities are required. Alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b all employ technically reliable, proven technologies. With adequate planning, it is anticipated that these remedies can be completed quickly without technical problems that would result in delays. Alternatives GW/SW-2a, GW/SW-2b, GW/SW-3a, and GW/SW-3b all rely, in part, on Institutional Controls, which is a proven, technically feasible technology. Although Institutional Controls can be administratively challenging, they can be implemented and completed quickly with adequate planning. These alternatives (except GW/SW-1) require off-site disposal of soil; however, all services and materials required to implement the alternatives would be relatively easy to obtain. Equipment and trained personnel are readily available for the pump and treat portion of the GW/SW-2a and GW/SW-2b alternatives, and the reactive media ZVI is offered by several vendors and is considered easy to obtain. Alternatives GW/SW-2a and GW/SW-2b are slightly easier to implement compared to GW/SW-3a and GW/SW-3b, however, the difference does not justify a different rating.

### **Costs**

Except for the cost of five-year reviews, there is no cost estimated as part of the No Action GW/SW-1 Alternative. Alternatives GW/SW-3a and GW/SW-3b, while requiring higher capital costs, have the lowest total cost (except GW/SW-1). Alternatives GW/SW-2a and GW/SW-2b, while having lower capital costs compared to GW/SW-3a and GW/SW-3b, have higher associated operation and maintenance costs, thus resulting in higher total costs. Alternatives GW/SW-2b and GW/SW-3b have slightly higher capital costs to alternatives GW/SW-2a and GW/SW-3a, respectively, due to the addition of the mid-plume *in-situ* treatment component. The costs for the alternatives are presented in Table 2.

## **Bedrock Groundwater**

### **Overall Protection of Human Health and the Environment**

The No Action BR-1 Alternative provides no protection of human health or the environment. Alternatives BR-2, BR-3, BR-4, and BR-5 are expected to provide protection of human health and the environment with proper implementation of institutional controls to prevent exposure to contaminated non-potable groundwater until non-potable groundwater cleanup levels are achieved. Institutional Controls will also prevent future use of groundwater within any potentially impacted areas of the Bungay River Water Resource Protection District until contaminant migration from the upgradient non-potable groundwater areas is controlled. If the contingency provided in Alternatives BR-3 through BR-5 is implemented, added groundwater treatment will clean up any exceedances of drinking water levels within the District.

### **Compliance with ARARs**

The No Action BR-1 Alternative would not meet chemical-specific ARARs since it does not prevent exposure to contaminated groundwater. No activities would be performed under Alternative BR-1, therefore action-specific and location-specific ARARs do not apply. With proper implementation, it is anticipated that Alternatives BR-2, BR-3, BR-4, and BR-5 would meet chemical-specific, action-specific, and location-specific ARARs (See Tables E-9a, -9b, -9c; E-10a, -10b, -10c; E-11a, -11b, -11c; and E-12a, -12b, -12c in the FS). Activities under Alternatives BR-2, BR-3, BR-4, and BR-5 may impact wetlands during well installation and potential active treatment (Alternatives BR-3, BR-4, and BR-5) if the contingency is implemented. EPA has made a draft determination that Alternative BR-3 is the least environmentally damaging practicable alternative under the federal Clean Water Act for protecting the wetland areas because it will include only limited disturbance of wetland areas (there may be more extensive disturbance in the event the contingency remedy is implemented) and then will restore any altered areas with native wetland vegetation. Limited work in the 100- and 500-year floodplains may occur with Alternative BR-3 (with more extensive potential impacts if the contingent remedy is implemented) and will result in temporary occupancy and modification of the floodplain. However, upon completion of any work in floodplain, the area will be backfilled to the original grade to avoid loss of flood storage capacity. As required by federal floodplain regulations, EPA has made a draft determination that there was no other practicable alternative to address contamination within the floodplain before selecting this alternative as the preferred remedy. Any impacts to wetlands and floodplains would be minimized and damage mitigated.

Wastes or water generated by well installation and groundwater monitoring, or the contingency components in alternatives BR-2, BR-3, BR-4, and BR-5, will be characterized and disposed of appropriately (with treatment, if required prior to disposal).

### **Long-term Effectiveness and Permanence**

The No Action BR-1 Alternative is the least effective alternative for long-term effectiveness and permanence because the risks identified in the baseline HHRA are not addressed. Alternatives BR-2, BR-3, BR-4, and BR-5 rely on institutional controls to prevent exposure to contaminated bedrock groundwater and monitoring of any attenuation processes to determine if groundwater cleanup standards can be achieved. The active bedrock treatment contingency for Alternatives BR-3, BR-4, and BR-5 would provide additional long-term effectiveness and permanence to any contaminant threat to the potable groundwater in the Bungay River Water Resource Protection District by either permanently removing and treating the groundwater (BR-4) or intercepting the plume and reducing contaminant toxicity and mobility (BR-3 and BR-5). BR-2 would rely solely on monitoring natural processes to reduce contaminant toxicity and mobility. With the exception of BR-1, the alternatives will provide a similar degree of initial long-term effectiveness and permanence within the non-potable areas of the Site. Any potential threat to the drinking water aquifer in the Bungay River Water Resource Protection District still needs to be assessed to fully determine which contingent remedy would be the most effective and permanent in the long-term.

### **Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment**

No treatment is provided under any of the alternatives for groundwater within the non-potable areas of the Site. If a contingent remedy needs to be implemented to protect groundwater within the Bungay River Water Resource Protection District, neither Alternative BR-1 nor BR-2 include treatment. The contingent remedies for Alternatives BR-3, BR-4, and BR-5 rely on active bedrock treatment to be either pumped and treated (BR-4) or intercept and treat groundwater contamination to reduce toxicity and mobility (BR-3 and BR-5). However, the challenges and uncertainties for the active treatment components in Alternatives BR-3, BR-4, and BR-5 would result in a similar rating.

### Short-term Effectiveness

Since no construction activities or remedial actions are proposed under Alternative BR-1, there are no additional short-term risks to the community or workers. Initial construction activities associated with Alternatives BR-2, BR-3, BR-4, and BR-5 (i.e., installing and sampling of monitoring wells) would present minimal risk or impact to the community and environmental receptors. The active bedrock treatment contingency components for Alternatives BR-3, BR-4, and BR-5 include more extensive site work compared to BR-2 and present short-term risks to workers, the community, and potentially environmental receptors during remedial activities. These risks would be easily mitigated via dust control, proper traffic planning, and engineering controls. Alternative BR-2 would have the least detrimental effects in the short-term when compared to the active remedy components of Alternatives BR-3, BR-4, and BR-5.

Alternative BR-1 would not achieve RAOs. Alternatives BR-2, BR-3, BR-4, and BR-5, in conjunction with components of the GW/SW alternatives directed at the source area soil removal and overburden groundwater, would work toward reducing bedrock groundwater concentrations to below non-drinking water cleanup levels, reducing concentrations in bedrock groundwater within the potentially impacted Bungay River Water Resource Protection District to below drinking water levels, and/or preventing potential further plume migration into the District.

### Implementability

The No Action Alternative (BR-1) is the easiest to implement because no remedial activities are required. Alternatives BR-2, BR-3, BR-4, and BR-5 rely on Institutional Controls, which is a proven, technically feasible technology. Institutional Controls can be administratively challenging, however, they can be implemented and completed quickly with adequate planning. The active bedrock treatment contingency components for Alternatives BR-3, BR-4, and BR-5 pose some technical challenges, with BR-3 and BR-5 being more difficult to design, construct, and implement. The active remedy component in Alternative BR-4 (pump and treat system) is routinely implemented for bedrock. Until additional investigations assess the potential scope of any contaminant threat to the drinking water aquifer in the Bungay River Water Resource Protection District, the full implementability challenges to carry out any required cleanup of the aquifer cannot be fully assessed.

### Costs

Except for the cost of five-year reviews, there is no cost estimated as part of the No Action BR-1 Alternative. For Alternatives BR-2, BR-3, BR-4, and BR-5, the capital costs are essentially equal because they contain the same initial remedy components. However, the contingency bedrock treatment components for Alternatives BR-3, BR-4, and BR-5 would increase the total capital cost and particularly the total net present value. Excluding Alternative BR-1, Alternative BR-4 would have the overall greatest total net present value, while Alternative BR-2 would have the least. Alternatives BR-3 and BR-5 would be similar in total net present value. The costs for the alternatives are presented in Table 2 (note the total capital and total net present value for Alternatives BR-2, BR-3, BR-4, and BR-5 include the contingency components).

## WHY EPA RECOMMENDS THIS PROPOSED CLEANUP PLAN

Based on the results of the Remedial Investigations, human health and ecological risk evaluations, EPA has prepared the Feasibility Study for the Site, and recommends this proposed cleanup plan because EPA believes it achieves the best balance among EPA's required criteria used to evaluate various alternatives. The Proposed Plan meets the cleanup objectives or Remedial Action Objections (RAOs) for the Site. This Proposed Plan includes a summary in general terms of why EPA recommends the cleanup plan for each component of the Site. For more detail, refer to the other sections of the Proposed Plan and the Feasibility Study Report.

**Alternative SL-3, soil excavation on residential properties with off-site disposal**, is EPA's preferred alternative because it permanently addresses the threat of direct exposure by removing and disposing of the contaminated soil from the residential yards west of North Avenue. It is the only Soil in Residential Yards alternative to meet ARARs.

**Alternative GW/SW-3B, source area soil removal with *in-situ* soil treatment and extension of permeable reactive barrier with mid-plume *in-situ* treatment**, is EPA's preferred alternative for the following reasons:

- Achieves substantial risk reduction by both permanently removing and disposing off-site source materials and treating remaining soils *in-situ*;
- Permeable reactive barriers are a proven, effective technology (currently employed and effective at the site), requires less overall operation and maintenance compared to the pump and treat alternatives (GW/SW-2a and -2b), and has better long-term effectiveness and permanence than the pump and treat alternatives (GW/SW-2a and -2b);
- The mid-plume *in-situ* treatment option would work to reduce the time to achieve cleanup levels; and
- Institutional Controls will prohibit future residential use of the W&L Property and prevent exposure to contaminated groundwater and vapor until groundwater cleanup goals are achieved.

**Alternative BR-3, Institutional Controls, and contingency remedy of focused *in-situ* injections**, if needed to address any impacts or further migration threat of contamination in the Bungay River Water Resource Protection District, is EPA's preferred alternative for the following reasons:

- Institutional Controls will prevent wells from being installed that would draw groundwater contamination into the Bungay River Water Resource Protection District and will prevent potential human exposure to contaminants in the bedrock groundwater that exceed target risk-based levels until cleanup goals are achieved (within the non-drinking water aquifer);
- Monitoring of the bedrock groundwater contaminant plume along with further pre-design sampling to define the downgradient portion of the plume will ensure the extent of institutional controls are protective, and determine whether additional (contingency) remedial action is necessary; and
- Focused *in-situ* injections (west of North Avenue), if implemented as the contingency remedy, requires less overall O&M compared to BR-4 (Pump and Treat), is less intrusive to residents than the BR-4 and BR-5 alternatives, and will work to prevent further plume migration and restore groundwater to meet federal and state standards.

EPA believes the proposed cleanup plan for the Walton & Lonsbury Superfund Site achieves the best overall balance among EPA's nine criteria (excluding State and community acceptance which will be considered following public comment) used to evaluate the various alternatives presented in the Feasibility Study. This cleanup approach provides both short- and long-term protection of human health and the environment; attains applicable federal environmental and state environmental and facility siting laws and regulations; reduces the toxicity, mobility, and volume of contaminants through treatment to the extent practicable; utilizes permanent solutions; and uses land use restrictions to prevent unacceptable exposures in the future to the remaining site-related contamination. While the approach may result in adverse impacts to floodplain and wetland areas, these impacts will be minimized to the extent practicable and restoration of unavoidable damages is included in the proposed cleanup.

EPA believes that this proposed cleanup approach is protective of human health and the environment through the use of proven cleanup technologies such as use or access restrictions, soil excavation, off-site disposal, *in-situ* soil treatment, permeable reactive barriers, and is cost-effective, while achieving the site-specific cleanup objectives within a reasonable timeframe.

## WHAT IS A FORMAL COMMENT?

EPA will accept public comments during a 30-day formal comment period, which runs from July 26, 2019 to August 26, 2019. EPA considers and uses these comments to improve its cleanup approach. During the formal comment period, EPA will accept written comments via mail, email, and fax. Additionally, verbal comments may be made during the formal Public Hearing on Wednesday, July 31, 2019 during which a stenographer will record all offered comments during the hearing. EPA will not respond to your comments during the formal Public Hearing but will respond to them in writing in a Responsiveness Summary, described below.

EPA will hold a brief informational meeting prior to the start of the formal Public Hearing on Wednesday, July 31, 2019. Additionally, once the formal Public Hearing portion of the meeting is closed, EPA can informally respond to any questions from the public.

EPA will review the transcript of all formal comments received during the hearing, and all written comments received during the formal comment period, before making a final cleanup decision. EPA will then prepare a written response to all the formal written and oral comments received. Your formal comment will become part of the official public record. The transcript of comments and EPA's written responses will be issued in a document called a Responsiveness Summary when EPA releases the final cleanup plan, in a document referred to as the Record of Decision (ROD). The Responsiveness Summary and Record of Decision will be made available to the public online, at the Attleboro Public Library, and at the EPA Records Center (see addresses below).

EPA will announce the final decision on the cleanup plan through the local media and on EPA's website.

## For More Detailed Information

The Administrative Record, which includes all documents that EPA has considered or relied upon in proposing this cleanup plan for the Walton & Lonsbury Superfund Site is available for public review shortly before the start of the comment period at the following locations:

EPA Records and Information Center  
5 Post Office Square, First Floor  
Boston, MA 02109-3912  
617-918-1440

Attleboro Public Library  
74 North Main Street  
Attleboro, MA 02703

This Proposed Plan and Administrative Record are also available for review online at:  
[www.epa.gov/superfund/walton](http://www.epa.gov/superfund/walton)

## Key Contacts

Ethan Finkel  
Superfund Project Manager  
EPA Region 1 New England  
617-918-1293  
[finkel.ethan@epa.gov](mailto:finkel.ethan@epa.gov)

Sarah White  
Superfund Community Involvement  
EPA Region 1 New England  
617-918-1026  
[white.sarah@epa.gov](mailto:white.sarah@epa.gov)

David Buckley  
State Project Manager  
Massachusetts Department of Environmental Protection  
617-556-1184  
[david.buckley@state.ma.us](mailto:david.buckley@state.ma.us)

### **Send Us Your Comments**

Provide EPA with your written comments about the Proposed Plan for the Walton & Lonsbury Superfund Site.

Please email ([finkel.ethan@epa.gov](mailto:finkel.ethan@epa.gov)), fax (617-918-0293), or mail comments, postmarked no later than August 26, 2019, to:

Ethan Finkel  
EPA Region 1 New England  
5 Post Office Square, Suite 100  
Mail Code: 07-1  
Boston, MA 02109-3912

## Acronyms

|           |   |
|-----------|---|
| ARAR      | Applicable or Relevant and Appropriate Requirement                    |
| BERA      | Baseline Ecological Risk Assessment                                   |
| bgs       | below ground surface  |
| CERCLA    | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR       | Code of Federal Regulation  |
| COC       | Contaminant of Concern  |
| COPC      | Contaminant of Potential Concern                                      |
| CSF       | Cancer Slope Factor   |
| CTE       | Central Tendency Exposure   |
| CWA       | Clean Water Act   |
| cy        | cubic yard  |
| EA        | Exposure Area   |
| EPA       | United States Environmental Protection Agency                         |
| FS        | Feasibility Study   |
| HHRA      | Human Health Risk Assessment  |
| HI        | Hazard Index  |
| HQ        | Hazard Quotient   |
| IC        | Institutional Control   |
| IUR       | Inhalation Unit Risk  |
| MassDEP   | Massachusetts Department of Environmental Protection                  |
| MassDEQE  | Massachusetts Department of Environmental Quality Engineering         |
| MCP       | Massachusetts Contingency Plan  |
| msl       | mean sea level  |
| NCP       | National Contingency Plan   |
| NPL       | National Priorities List  |
| O&M       | Operation and Maintenance   |
| PAH       | Polycyclic aromatic hydrocarbon                                       |
| PDI       | Pre-design investigation  |
| PPE       | Personal Protective Equipment   |
| PRB       | Permeable Reactive Barrier  |
| PRG       | Preliminary Remediation Goal  |
| RAO       | Remedial Action Objective   |
| RfD       | Reference Dose  |
| RfC       | Reference Concentration   |
| RI        | Remedial Investigation  |
| RME       | Reasonable Maximum Exposure   |
| ROD       | Record of Decision  |
| SLERA     | Screening-level Ecological Risk Assessment                            |
| TBC       | To-be-Considered  |
| TCE       | Trichloroethene   |
| 1,1,1-TCA | 1,1,1-Trichloroethane   |
| UCL       | Upper Concentration Limit   |
| µg/dL     | micrograms per deciliter  |
| VI        | Vapor intrusion   |
| VOC       | Volatile Organic Compound   |
| W&L       | Walton & Lonsbury   |
| ZVI       | Zero-valent iron  |

**Table 1: Preliminary Remediation Goals (PRGs)**

| Contaminant   | Selected PRG | Basis  | Maximum Detection |
|---|--------------|--|-------------------|
| <b>W&amp;L Property – Soil<sup>1</sup></b>                                  |              |  |                   |
| Benzo(a)anthracene  | 11 mg/kg     | ILCR = $10^{-5}$                             | 41 mg/kg          |
| Benzo(a)pyrene  | 1.1 mg/kg    | ILCR = $10^{-5}$                             | 34 mg/kg          |
| Benzo(b)fluoranthene  | 11 mg/kg     | ILCR = $10^{-5}$                             | 36 mg/kg          |
| Dibenz(a,h)anthracene   | 1.1 mg/kg    | ILCR = $10^{-5}$                             | 10 mg/kg          |
| Antimony  | 31 mg/kg     | HQ = 1                                       | 1,500 mg/kg       |
| Arsenic   | 6.8 mg/kg    | ILCR = $10^{-5}$                             | 13 mg/kg          |
| Chromium, Hexavalent  | 3 mg/kg      | ILCR = $10^{-5}$                             | 470 mg/kg         |
| Cobalt  | 23 mg/kg     | HQ = 1                                       | 2,700 mg/kg       |
| Lead  | 200 mg/kg    | Lead (IEUBK Model)                           | 3,100 mg/kg       |
| Thallium  | 0.78 mg/kg   | HQ = 1                                       | 3.7 mg/kg         |
| <b>Residential Yards West of North Avenue – Soil (residential)</b>          |              |  |                   |
| Lead  | 200 mg/kg    | Lead (IEUBK Model)                           | 1,240 mg/kg       |
| <b>W&amp;L Property – Shallow Groundwater (construction/utility worker)</b> |              |  |                   |
| Chromium, Hexavalent  | 985 µg/L     | ILCR = $10^{-5}$                             | 83,000 µg/L       |
| <b>Bliss Brook – Surface Water</b>  |              |  |                   |
| Chromium  | 82 µg/L      | Geometric Mean of LOEC and NOEC (Ecological) | 436 µg/L          |
| Chromium, Hexavalent  | 8 µg/L       | Geometric Mean of LOEC and NOEC (Ecological) | 238 µg/L          |
|   | 3.4 µg/L     | ILCR = $10^{-5}$ (Recreational)              | 219 µg/L          |
| <b>Site-wide Groundwater (non-potable, irrigation)</b>                      |              |  |                   |
| Trichloroethene   | 98 µg/L      | HQ = 1                                       | 1,300 µg/L        |
| Vinyl Chloride  | 7 µg/L       | ILCR = $10^{-4}$                             | 33 µg/L           |
| Chromium, Hexavalent  | 100 µg/L     | ILCR = $3 \times 10^{-4}$                    | 83,000 µg/L       |
| <b>Site-wide Groundwater (potable, residential)<sup>2</sup></b>             |              |  |                   |
| 1,1,1-Trichloroethane   | 200 µg/L     | MCL  | 2,600 µg/L        |
| 1,1-Dichloroethane  | 2.8 µg/L     | ILCR = $10^{-6}$                             | 1,700 µg/L        |
| cis-1,2-Dichloroethene  | 70 µg/L      | MCL  | 790 µg/L          |
| Trichloroethene   | 5 µg/L       | MCL  | 1,300 µg/L        |
| Vinyl Chloride  | 2 µg/L       | MCL  | 33 µg/L           |
| 1,4-Dioxane   | 0.46 µg/L    | ILCR = $10^{-6}$                             | 23 µg/L           |
| Arsenic   | 10 µg/L      | MCL  | 13 µg/L           |
| Chromium  | 100 µg/L     | MCL  | 86,400 µg/L       |
| Chromium, Hexavalent  | 0.035 µg/L   | ILCR = $10^{-6}$                             | 83,000 µg/L       |
| Cobalt  | 6 µg/L       | HQ = 1                                       | 635 µg/L          |
| Lead  | 15 µg/L      | Action Level                                 | 108 µg/L          |
| Manganese   | 300 µg/L     | Health Advisory                              | 21,000 µg/L       |

Notes:

ILCR = Incremental Lifetime Cancer Risk

HQ = Hazard Quotient for non-cancer risks

MCL = Maximum contaminant level

mg/kg = milligram per kilogram

µg/L = microgram per liter

LOEC = Lowest Observed Effect Concentration

NOEC = No Observed Effect Concentration

Lead = The use of the IEUBK (Integrated Exposure Uptake Biokinetic) Model with updated parameters and a target blood lead level of 5 µg/dL (micrograms per deciliter) provides for an acceptable residential soil concentration of approximately 200 mg/kg

Health Advisory = Health Advisory on Manganese (EPA-822-R-04-003; January 2004)

1. A future residential scenario at the W&L property was evaluated as part of the baseline HHRA to determine any potential risk(s). Remedial alternatives to address unacceptable risk to future residents from surface/subsurface soil and groundwater at the W&L property were evaluated in the FS. However, these alternatives are not carried forward in this Proposed Plan, as the current and reasonably anticipated future land use of the W&L property is industrial. However, Institutional Controls to prohibit future residential use of the property are warranted.

2. The Groundwater Use & Value Determination developed by MassDEP determined Site-wide groundwater is unlikely to be utilized as a source of drinking water, but because there is potential for groundwater to be used as a future drinking water source within the downgradient Bungay River Water Resource Protection District, performance standards were developed for compliance monitoring purposes, to evaluate the performance of remedial alternatives that may be implemented to prevent plume migration from continuing.

**Table 2**  
**Comparative Analyses of Remedial Alternatives**

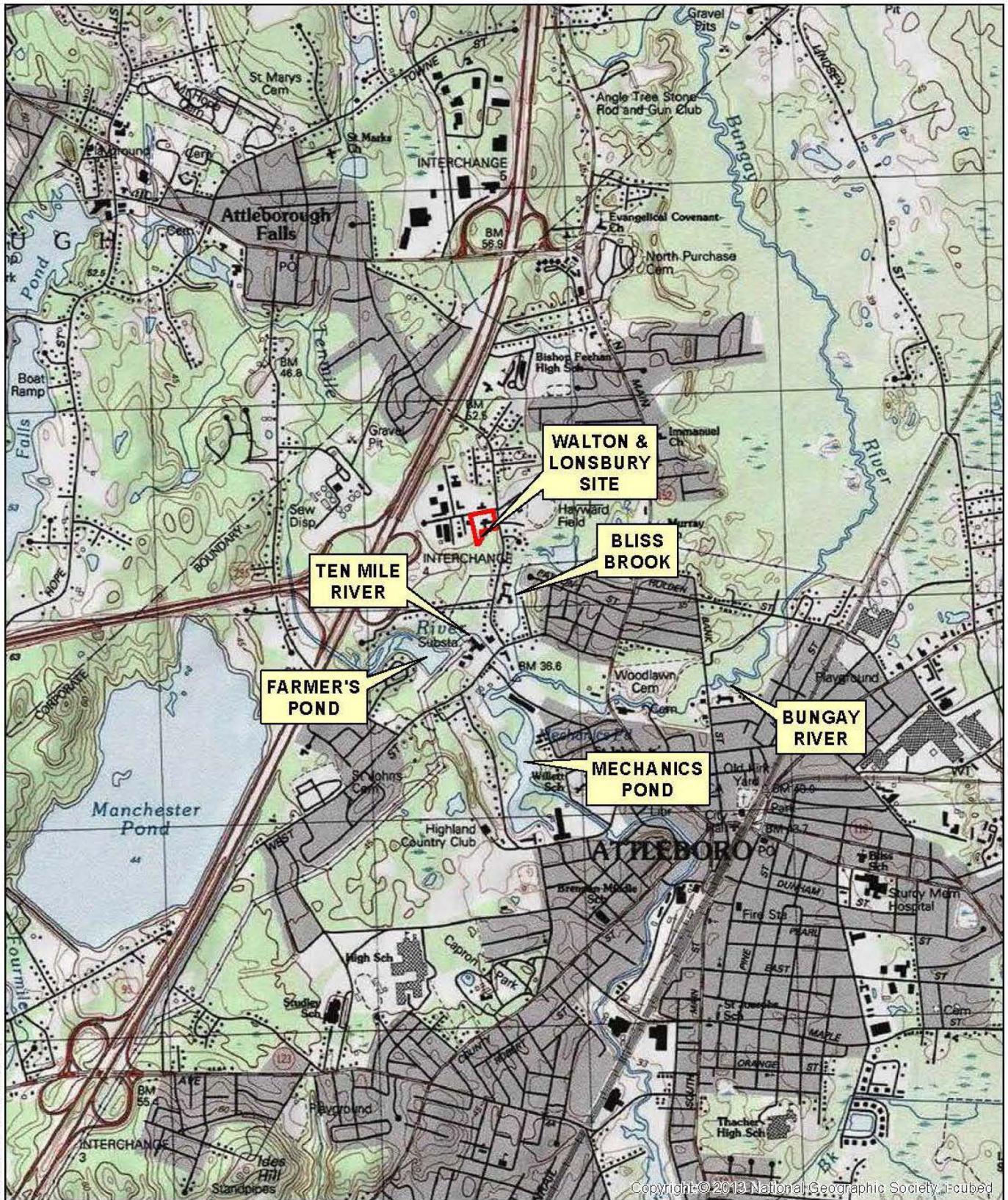
| ALTERNATIVES BY MEDIUM  | Overall Protection of Human Health and the Environment | Compliance with ARARs | Long-Term Effectiveness and Permanence | Reduction of Toxicity, Mobility, or Volume Through Treatment | Short-Term Effectiveness | Implementability | COSTS <sup>1</sup> |               |                 |                           |
|---|--|-----------------------|--|--|--------------------------|------------------|--------------------|---------------|-----------------|---------------------------|
|   |  |                       |  |  |                          |                  | Capital Cost       | Periodic Cost | Annual O&M Cost | Total (Net Present Value) |
| SOIL IN RESIDENTIAL YARDS   |  |                       |  |  |                          |                  |                    |               |                 |                           |
| Alternative SL-1: No Action   | □  | □                     | ◆                                      | N/A  | ◆◆◆                      | ◆◆◆              | \$0                | \$0           | \$0             | \$0                       |
| Alternative SL-3: Soil Excavation on Residential Properties with Off-Site Disposal  | ■  | ■                     | ◆◆◆                                    | ◆◆◆  | ◆◆                       | ◆◆               | \$422,000          | \$0           | \$0             | \$422,000                 |
| OVERBURDEN GROUNDWATER AND SURFACE WATER  |  |                       |  |  |                          |                  |                    |               |                 |                           |
| Alternative GW/SW-1: No Action  | □  | □                     | ◆                                      | N/A  | ◆◆◆                      | ◆◆◆              | \$0                | \$0           | \$0             | \$0                       |
| Alternative GW/SW-2a: Source Area Soil Removal with In-Situ Soil Treatment and Groundwater Pump and Treat                                       | ■  | ■                     | ◆◆                                     | ◆◆◆  | ◆◆                       | ◆◆               | \$9,234,000        | \$177,000     | \$342,000       | \$18,611,000              |
| Alternative GW/SW-2b: Source Area Soil Removal with In-Situ Soil Treatment and Groundwater Pump and Treat with Mid-Plume Treatment              | ■  | ■                     | ◆◆                                     | ◆◆◆  | ◆◆                       | ◆◆               | \$9,947,000        | \$177,000     | \$342,000       | \$19,325,000              |
| Alternative GW/SW-3a: Source Area Soil Removal with In-Situ Soil Treatment and Extension of Permeable Reactive Barrier                          | ■  | ■                     | ◆◆◆                                    | ◆◆◆  | ◆◆                       | ◆◆               | \$11,151,000       | \$177,000     | \$161,000       | \$15,667,000              |
| Alternative GW/SW-3b: Source Area Soil Removal with In-Situ Soil Treatment and Extension of Permeable Reactive Barrier with Mid-Plume Treatment | ■  | ■                     | ◆◆◆                                    | ◆◆◆  | ◆◆                       | ◆◆               | \$12,0572,000      | \$177,000     | \$161,000       | \$16,573,000              |
| BEDROCK GROUNDWATER   |  |                       |  |  |                          |                  |                    |               |                 |                           |
| Alternative BR-1: No Action   | □  | □                     | ◆                                      | N/A  | ◆◆◆                      | ◆◆◆              | \$0                | \$0           | \$0             | \$0                       |
| Alternative BR-2: Institutional Controls  | ■  | ■                     | ◆◆                                     | ◆  | ◆◆◆                      | ◆◆◆              | \$963,000          | \$74,000      | \$124,000       | \$4,379,000               |
| Alternative BR-3: Institutional Controls (with Contingency for Focused In-Situ Injections West of North Avenue) <sup>2</sup>                    | ■  | ■                     | ◆◆                                     | ◆◆◆  | ◆◆                       | ◆                | \$963,000          | \$74,000      | \$124,000       | \$4,379,000               |
|   |  |                       |  |  |                          |                  | \$608,000          | \$360,000     | \$0             | \$927,000                 |
| Alternative BR-4: Institutional Controls (with Contingency for Pump and Treat) <sup>2</sup>   | ■  | ■                     | ◆◆                                     | ◆◆◆  | ◆◆                       | ◆◆               | \$963,000          | \$74,000      | \$124,000       | \$4,379,000               |
|   |  |                       |  |  |                          |                  | \$569,000          | \$0           | \$97,000        | \$3,197,000               |
| Alternative BR-5: Institutional Controls (with Contingency for Enhanced [Deeper] Permeable Reactive Barrier) <sup>2</sup>                       | ■  | ■                     | ◆◆                                     | ◆◆◆  | ◆◆                       | ◆                | \$963,000          | \$74,000      | \$124,000       | \$4,379,000               |
|   |  |                       |  |  |                          |                  | \$700,000          | \$360,000     | \$0             | \$1,019,000               |

Notes:

- Fails
- Passes
- ♦ Lowest (least favorable)
- ♦♦ Medium
- ♦♦♦ Highest (most favorable)

<sup>1</sup> rounded to the nearest \$1,000. Periodic cost presented is total, not Net Present Value (NPV). Annual O&M cost presented is total O&M cost for one year, not NPV. Total (NPV) cost presented is the sum of capital cost, NPV of periodic cost for 30 years, and NPV of annual O&M cost for 30 years. See Appendix D of the FS for details.

<sup>2</sup> costs for the initial and contingency portions of Alternatives BR-3, BR-4, and BR-5 are presented separately.



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1:25,000  
0 1,250 2,500  
Feet

**FIGURE 1.**  
**SITE AREA MAP**

